COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

June 24, 2015
Facilitator's Summary
Facilitator, Emily Plummer; Notes, Tory Hines DS Consulting

The following Facilitator's Summary is intended to capture basic discussion, decisions and actions, as well as point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Dworshak/Lower Granite Water Temperature

Kevan Schneidmiller, USACE-Walla Walla, provided an update on Dworshak and Lower Granite operations. He noted that temperature models indicate a need to increase Dworshak outflow in order to maintain water temperatures below 68 degrees in the Lower Granite tailrace. The Corps plans to increase Dworshak outflows to 8.5kcfs at midnight tonight and will likely increase to full powerhouse by June 26th or 28th, depending on the forecast; the Corps will continue to run models daily to determine when to go to full powerhouse or higher if necessary to maintain Lower Granite tailrace below 68°F. There was inquiry as to if the Corps could expand the STP model to estimate the impact of the current operation on the amount of available cool water from Dworshak in August/September. Kevan noted the difficulty in modeling future temperatures without a current forecast. However, despite multiple assumptions used, volume modelling is more accurate and will be provided to TMT. He also noted this season is experiencing unusually warm air temperatures, which are expected to continue.

Karl Kanbergs, COE-NWD, noted that the STP provides the best available estimate of water volumes and incorporates current data from Walla Walla. The project estimates that going to full powerhouse towards the end of June through July will likely result in Dworshak outflow of approximately 8-8.5 kcfs in August. Steve Hall, USACE-Walla Walla, also noted that if the operation is a higher Dworshak outflow in July, then August outflows will be in the neighborhood of 4 kcfs. Steve continued that per TMT coordination, the project is operating to maintain a 1-1.5 degree water temperature buffer below 68°F in the Lower Granite tailrace, noting that the Dworshak gas cap is typically around 13-14kcfs, compared to full powerhouse which is around 10kcfs.

- ACTION: The Corps will continue to provide TMT with updated water temperature modelling results; they will also provide TMT with modelled forecasts of potential impacts of current operations on late summer water volumes.

Little Goose Operation Update

Doug Baus, COE-NWD, followed up with TMT members after the Corp's email notification sent out last week regarding a change in spill operation at Little Goose Dam (LGS). He reiterated that on June 16th the project shifted operations from 30% spill to a constant rate of 7, 9, or11kcfs as a result outflows dropping to less than or equal to 32kcfs. Doug noted that this operation is consistent with the Fish Operation Plan. He continued that there are multiple factors contributing to the limited flexibility of the operation, specifically the low flows, issues switching between units at LGS, temperature challenges at Dworshak/Lower Granite, access to the LGS navigation lock, and uncertainty around the release of water from Brownlee. Concerns

were expressed regarding both the process of determining the current operation, as well as the criteria of the operation:

- Idaho suggested that there is misunderstanding around the operation, noting that previous year's operations called for a step approach designed to help smooth out the operation: when flows are ≤32kcfs operate to a constant 11kcfs outflow; ≤28kcfs operate to a constant 9kcfs outflow; ≤24kcfs operate to a constant 7kcfs outflow.
- The Corps noted that so far in this operation, spill percentages have fluctuated, spilling above and below 30% at times, however, targeting a daily average of 30%.
- The Corps pointed out that in previous years this operation was conducted in mid- to late August; this year's low flows required implementation in mid-June which greatly increases the duration of the operation and the frequency of flow oscillations.
- Oregon inquired as to if the LGS navigation lock operation had influenced the spill operations, to which the Corps responded no, the increase in MOP for the navigation lock safety (June 14th) had not impacted the spill operation.
- Oregon also inquired as to the specifics of when and what criteria were met that led to the shift in operation from 30% spill to a constant flat spill of 11, 9, or 7kcfs. The Corps responded that the operation was implemented on June 16th at 0900, based on the previous day's 24-hour average total project outflow of 31.8 kcfs, which is below the 32 kcfs threshold, and the RFC 10-day forecast that indicated flows would remain below 32 kcfs. The criterion is outlined in the 2015 FOP.
- The Corps noted that daily project outflows have remained below 32kcfs every day since June 15th with June 16th being the exception. The day average on June 15th was 31.8kcfs; June 16th the day average was 35kcfs.
- It was noted that the spill criteria for LGS is provided in the 2015 FOP.

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Due to the different understandings of the operation, the Facilitator suggested that TMT table the conversation until after FPAC can meet to discuss their desired operation. Salmon Managers agreed to meet and work on a suggested operation to bring to TMT.

- ACTION: FPAC will meet today at 2:30PM to discuss in-season management and what they would like to see moving forward with the LGS operation.
- ACTION: Russ Kiefer and Scott Bettin will connect to recap past LGS low flow spill operations and associated documentation coordinated through TMT.
- ACTION: TMT will meet on June 25th at 9:00 to revisit the LGS operation.

The next TMT meeting will be a conference call on June 25th at 9:00am.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM—OFFICIAL MINUTES

June 24, 2015
Minutes: Pat Vivian

1. Introduction

Representatives of the USFWS, BPA, NOAA, COE, Oregon, CRITFC/Umatilla Tribe, Idaho, Nez Perce Tribe, COE, BOR, Yakama Tribe and Montana participated in today's TMT conference call. Doug Baus, COE, chaired the meeting, with facilitation by Emily Plummer, DS Consulting. This summary is an official record of the conversation, not a verbatim transcript.

2. Dworshak/Lower Granite Water Temperature

Kevan Scheidmiller, COE Walla Walla, reported. The latest COE modeling, as of 4 pm, June 23, is posted to today's agenda. It indicates that Dworshak outflows should be increased to 8.5 kcfs at midnight tonight to prevent an exceedance of the 68 degrees F Lower Granite tailwater criteria tomorrow. Over the weekend (June 26-28), releases will probably need to be increased to full powerhouse depending on the weather forecast. With temperature forecasts rising steadily, the COE plans to run daily models to determine what is needed (e.g. full powerhouse flows) to keep Granite tailwater temperatures below the 68 degrees F BiOp criteria.

Dave Statler, Nez Perce Tribe, asked whether the model runs take into account the potential impact of increasing Dworshak discharges to 8.5 kcfs and potentially full powerhouse on Dworshak's ability to provide cool water later in the summer. What we do now will have impacts when the need for cool water is ongoing. Scheidmiller said the COE has been focusing on managing to the 68 degrees F criteria in the near term, but will also provide STP modeling of the longer term effects of these releases. It's difficult to model reservoir operations based on temperature forecasts, which are short term. However, STP volume modeling can be used for longer term projections.

Record high temperatures are now being forecast for the Snake basin on a daily basis. Dworshak will probably either go to higher flows or full powerhouse in July, Karl Kanbergs, COE, said. The STP projection indicates that, based on July releases that will be needed for temperature control, Dworshak could be limited to releases of 4-7 kcfs in August in order to target 1535 ft elevation by the end of the month.

Steve Hall, COE, gave a "bookend" prediction: One end would be to run Dworshak at full powerhouse, or 8.5 kcfs, through July, dropping to 8 kcfs in August. This would allow the COE to continue providing a 1-1.5 degrees F buffer for temperature management at Lower Granite. The other possibility would be to release gas cap flows in July. Joe Skalicky, USFWS, asked how the bookends compare in terms of equivalent water volume. The difference between operating to the gas cap

(approximately 13-14 kcfs) and full powerhouse (approximately 10 kcfs) would be around 3.5 kcfs for 30 days, Hall replied. The COE is conserving water now by operating as closely as possible to the target temperature while avoiding exceedances through the rest of June.

Tom Lorz, CRITFC/Umatilla, asked about water particle travel time, and Hall said it's around 3 days, meaning fish take approximately 3 days to travel from Dworshak to Lower Granite Dam. This information will be factored into planning Dworshak releases. The COE will continue to provide daily temperature modeling as well as modeling the longer term effects of Dworshak flow augmentation releases.

3. Little Goose Low Flow Operations

On Tuesday, June 16 Baus emailed the TMT that Little Goose Dam switched from 30% to a constant spill of 7-11 kcfs based on achieving the criteria of less than equal to 32 kcfs indentified in the FOP on Monday, June 15. This is the same LGS low flow operation that has been previously coordinated with the TMT.

Baus asked TMT for questions and feedback on the current operation as well as plans for managing Little Goose flows through the rest of spill season.

Russ Kiefer, **Idaho**, said he hasn't been able to track down any documentation (meeting notes or an FPOM change form to the Fish Operations Plan) of a regional agreement specifying when Little Goose releases would drop from 11 kcfs to 9 then 7 kcfs. Kiefer said he believes Little Goose spill levels are dropping lower than the Salmon Managers originally intended, based on hourly not daily average spill percentages. As he recalled, TMT agreed the project would drop to flat spill levels of 11, 9 and 7 kcfs when these levels were equivalent to no less than 30% of total river flow.

The lower spill levels of 11, 9 and 7 kcfs were coordinated at TMT in an adaptive management process, not in an FPOM change form, Baus said. Little Goose has been spilling more than 30% of the river daily since June 16, at times significantly more, e.g 41%. What's vastly different about this year's operation than previous years is the switch to lower flows is occurring in June instead of the last three weeks of August. Operational limits of 1% efficiency in conjunction with MOP requirements and wide swings in releases from Brownlee and Hells Canyon are serious impediments to managing 30% spill at Little Goose during low flows.

Baus emphasized the Action Agencies are willing to accommodate the Salmon Managers' preferences at this time. A critical nuance will be whether Little Goose spill percentages are calculated as an hourly or daily average. Several influences complicate flow management at Little Goose – MOP operations for navigation safety, Dworshak outflow changes, the unpredictability of Brownlee Dam releases, and weather forecast variability. On a daily average basis, Kiefer said, some days Goose has spilled less than 30% which is not what TMT agreed to. He thought the agreement was to switch to 11 kcfs releases when Little Goose inflows drop below 32 kcfs, then 9 kcfs when inflows drop below 28 kcfs and 7 kcfs when flows drop below 21 kcfs.

Baus said the project has consistently been spilling above 30% since June 16 on a daily basis and asked for clarification from the Salmon Managers of an appropriate trigger for switching to lower spill levels based on a daily average vs hourly time step. If Dworshak flows increase as predicted, spill levels could drop below 30%. Scott Bettin, BPA, noted that flows have not gone below the 32 kcfs trigger at Little Goose in any previous June, so the situation is unprecedented. Baus assured TMT that the COE does not plan to drop spill below 30% as a daily average at Goose, while acknowledging that hourly time steps might yield different results. The 2015 FOP states that when flows at Little Goose are less than equal to32 kcfs as a daily average, which they were on June 15, the project will transition to a constant spill level of 7-11 kcfs.

Moving forward, the Action Agencies asked the Salmon Managers for specific recommendations as to how flows at Little Goose should be managed under these circumstances.

Erick Van Dyke, **Oregon**, asked how raising the tailwater for navigation influenced spill percentages. On June 16, Baus replied, the COE notified TMT via email that MOP increased at Little Goose on June 15 and the project went to constant spill, based on a forecast of less than 32 kcfs total river flow. Raising the pools for navigation did not directly impact spill operations, Baus noted. The COE also increased MOP at Ice Harbor on June 15 in response to navigation needs. When the Little Goose operation switched from 11 kcfs to 9 kcfs spill on June 16, the daily average spill level was 30%, but the next day inflows dropped to 28 kcfs and spill rose to 38% of the river. The drop in inflows caused such a variety of spill percentages, the COE has since toggled between 7, 9, and 11 kcfs in a single day trying to stabilize the operation.

Van Dyke asked, was the daily average used on June 16 as a basis for changing to 9 kcfs releases greater than, equal to or less than 32 kcfs? The 24 hour average on June 16 was 35.2 kcfs, but that information wasn't available when the decision was made, Baus said. The most recently available daily average was 31.8 kcfs on June 15, which is less than 32 kcfs and served as the basis for the change. On page 6 of the 2015 FOP, flows of less than equal to 32 kcfs are identified as the trigger for switching from 30% spill to low flow operations at Goose.

Van Dyke stated for the record that Oregon shares Idaho's concern regarding the lack of documented criteria for decision making at Little Goose. Kiefer said he will follow up with the Action Agencies on previous documentation of what TMT agreed to regarding Little Goose operations in past low flow years.

Because FPAC had not yet discussed Little Goose operations before today's TMT call, there was general agreement that an FPAC meeting at 2:30 that afternoon was the appropriate next step. FPAC will focus on identifying the best in-season management strategy for Little Goose. The COE will continue to operate the project to a 30% daily spill average until FPAC provides recommendations in a TMT conference call tomorrow morning, June 25.

Name	***Affiliation***
Joe Skalicky	USFWS
Tony Norris	BPA
Paul Wagner	NOAA
Erick Van Dyke	Oregon
Scott Bettin	BPA
Tom Lorz	CRITFC/Umatilla
Russ Kiefer	Idaho
Doug Baus	COE
Lisa Wright	COE
Julie Ammann	COE
Karl Kanbergs	COE
Dave Statler	Nez Perce
Mary Mellema	BOR
Dave Lyman	PGE
Tom Iverson	Yakama
Michael Bryant	CBB
Tory Hines	DSC
Greg Lawson	Thompson Reutters
Kevan Scheidmiller	COE Walla Walla
Jim Litchfield	Montana
Steve Hall	COE Walla Walla